

WHAT IS CLAIMED IS:

1. A cartridge for use in a camera, the cartridge comprising:
a photosensitive element having an exposure surface;
a housing having a storage area for storing the photosensitive element and an opening adapted to permit transport of the photosensitive element from a storage position within the housing to an exposure position outside of the housing; and,
a micro-lens array joined to the housing and positioned to confront the exposure surface when the photosensitive element is in the exposure position.
2. The cartridge of claim 1, wherein the micro-lens array is elastically deflectable.
3. The cartridge of claim 1, wherein the micro-lens array is sufficiently flexible to adapt to the shape of a non-planar exposure area in the camera.
4. The cartridge of claim 1, wherein the housing further comprises an array storage area having an array opening for retaining said micro-lens array and an array opening adapted to permit transport of the micro-lens array from an interior position within the array storage area to the position that confronts when the photosensitive element is moved to the exposure position.
5. The cartridge of claim 4, wherein the housing further comprises a photosensitive element contact surface that moves the photosensitive element from the interior position to the position that confronts the exposure surface in response to movement of the photosensitive element from the storage position to the exposure position.
6. The cartridge of claim 4, wherein the housing further contains a drive member adapted to engage a drive system on the camera and having a thrust

system that moves the micro-lens array from the interior position to the position that confronts the exposure surface.

7. The cartridge of claim 1 wherein the micro-lens array comprises a substantially rigid form.

8. The cartridge of claim 1, wherein the micro-lens array is formed from a substantially rigid non-planar form.

9. The cartridge of claim 1, wherein the micro-lens array comprises an array of micro-lenses with each micro-lens in the array having a light receiving surface adapted to receive light from the primary lens and a light focusing surface confronting a photosensitive element, with the light focusing surface adapted to concentrate the received light onto the photosensitive element.

10. The cartridge of claim 1, wherein the micro-lens array comprises an array of micro-lenses with each micro-lens in the array having a light receiving surface adapted to receive light from the primary lens and to concentrate the received light onto the photosensitive element.

11. The cartridge of claim 1, wherein the cartridge comprises a supply chamber, an exposure chamber and a receiving chamber.

12. The cartridge of claim 11, wherein the cartridge is adapted for use in a camera that exposes a photosensitive element located in the exposure chamber to light from a scene during an exposure and wherein the array of micro-lenses is joined to the housing so that the array of micro-lenses is positioned between the scene and the photosensitive element when the film is in the exposure chamber.

13. The cartridge of claim 1 wherein said cartridge is in cassette form.

14. A cartridge for use in a camera, the cartridge comprising:
a housing having a photosensitive element with an exposure surface and an opening adapted to permit transport of the photosensitive element from a storage position within the housing to an exposure position outside of the housing; and,

a micro-lens array joined to the housing and positioned to confront the exposure surface when the photosensitive element is in the exposure position;

wherein each micro-lens is positioned to receive focused light from a scene and adapted to fracture the received light into a first fraction and a second fraction with the first fraction concentrated to form a first image on a first portion of the photosensitive element when the light received during an exposure is within a first range, with said second fraction passing onto the photosensitive element to form a second image on a second portion of the photosensitive element when the light received during an exposure is within a second range.

15. The cartridge of claim 14, wherein the micro-lens array includes micro-lenses having an f-number of 1.5 to 16.

16. The cartridge of claim 14, wherein the micro-lens array includes micro-lenses having an aperture of 3 to 100 microns.

17. The cartridge of claim 14 wherein said cartridge is in cassette form.

18. A camera system comprising:
a camera body having a chamber adapted to receive a cartridge;
a lens system to focus light from a scene toward an exposure area inside the camera body; and
an exposure control system for controllably allowing light to pass from the lens system to the exposure area to define an exposure;

said cartridge having a housing with an opening adapted to permit transport of a photosensitive element from a storage position within the housing to the exposure area; and a micro-lens array joined to the housing and positioned to confront the photosensitive element when the photosensitive element is in the exposure area with each micro-lens adapted to receive light from the lens system and to concentrate a first fraction of the received light a first image on a first portion of the photosensitive element when the amount of light received from the lens system during exposure is within a first range, with a second fraction of the received light passing onto the photosensitive element to form a second image on a second portion of the photosensitive element when the amount of light received from the lens system during exposure is within a second range.

19. The camera system of claim 18 further comprising a controller to determine an effective latitude of the photosensitive element and to adjust operation of the exposure control system to capture an image on at least one of the first portion or second portion of the photosensitive element.

20. The camera system of claim 18, wherein the exposure control system comprises a shutter system.

21. The camera system of claim 18, wherein the exposure control system comprises an adjustable aperture control system.

22. The camera system of claim 19 wherein the controller is adapted to adjust operation of the exposure control system based upon at least one of the determined first and second ranges.

23. The camera system of claim 21 wherein the controller determines an effective latitude of the photosensitive element based in part on the aperture size.

24. The camera system of claim 19 further comprising a gate that is adjustable between a setting for holding a photosensitive element to receive light from the lens system and a position for holding a photosensitive element and a micro-lens array to receive light from the lens system.

25. The camera system of claim 19 wherein the controller is also adapted to receive signals from a sensor that is adapted to detect whether a cartridge that has a micro-lens array, and the controller is operable in a first mode when a cartridge having a micro-lens array is detected and is also operable in a second mode when a cartridge that does not have a micro-lens is detected.

26. The camera system of claim 25 wherein the controller operates the exposure control differently in each mode.

27. The cartridge of claim 18 wherein said cartridge is in cassette form.

28. A camera system for recording images on a photosensitive element having a photosensitive surface, the photosensitive element being associated with a cartridge having a memory containing data from which the effective sensitivity of the photosensitive element can be determined, the camera system comprising:

a lens unit adapted to controllably focus light from a scene onto a photographic film strip;

an exposure control system to controllably pass light from the lens unit to the photosensitive element;

a reader for reading information recorded in the memory and providing read information to the controller; and

a controller for causing the image capture unit to expose the photosensitive surface to light from the scene;

wherein the controller causes the reader to read the information in the memory and the image capture unit to expose the photosensitive surface to

light from the scene in a manner that is at least in part determined by the information recorded in the memory.

29. The camera of claim 28, wherein memory contains information that the controller can use to determine the effective sensitivity of the photosensitive element.

30. The camera of claim 28 further comprising a source of artificial scene illumination and the controller determines whether to introduce artificial scene illumination based upon the effective sensitivity of the photosensitive element.

31. A variable latitude camera comprising:
a lens unit collecting light and focusing that light at an imaging plane;
an exposure control system to controllably pass light from the lens unit to the imaging plane during an exposure;
an aperture setting system that is adjustable to allow different amounts of light to pass from the scene to the imaging plane during an exposure;
an array micro-lenses mounted at the imaging plane and defining a focal plane; and
a gate positioning a photosensitive surface for recording images at the focal plane defined by the micro-lenses.

32. The variable latitude camera of claim 31 wherein said photosensitive surface is a light sensitive silver halide film.

33. The variable latitude camera of claim 31 where the photosensitive surface is a solid-state photo sensor.

34. The cartridge of claim 31 wherein said cartridge is in cassette form.

35. The variable latitude camera of claim 31 wherein said micro-lenses and photosensitive surface are combined in cartridge, said cartridge comprising:

a photosensitive element having a photosensitive surface

a housing having a storage area for storing the photosensitive element and an opening adapted to permit transport of the photosensitive element from a storage position within the housing to an exposure position outside of the housing; and,

a micro-lens array joined to the housing and positioned to confront the photosensitive surface when the photosensitive element is in the exposure position.

36. A variable latitude camera comprising:

a lens unit for collecting light and focusing that light at an imaging plane;

an exposure control system to controllably pass light from the lens unit to the imaging plane during an exposure;

an array of individually convex converging micro-lenses positionable at the imaging plane and defining a focal plane; and

a gate adapted to position a photosensitive surface;

wherein one of the array and the gate is selectively positioned relative to each other at one of a first position wherein a first portion of the light passing through the imaging plane is focused by the micro-lenses to form differently focused images on different portions of the photosensitive element and a second position wherein a single focused image is formed on the photosensitive element.

37. The variable latitude camera of claim 36 wherein said photosensitive surface is a light sensitive silver halide film.

38. The variable latitude camera of claim 36 where the photosensitive surface is a solid-state photo sensor.

39. The variable latitude camera of claim 36 wherein said micro-lenses and photosensitive element are combined, to form a cartridge comprising:

- a photosensitive element having an photosensitive surface;
- a housing having a storage area for storing the photosensitive element and an opening adapted to permit transport of the photosensitive element from a storage position within the housing to an exposure position outside of the housing; and,
- a micro-lens array joined to the housing and positioned to confront the photosensitive surface when the photosensitive element is in the exposure position.

40. The camera system of claim 39, wherein said cartridge is in cassette form.